REPORT AND RECOMMENDATIONS REGARDING THE HIGHWAY SMOKE HAZARD OF FALL, 1987

FEBRUARY, 1988

INTRODUCTION

The disposal of brush or peat has historically been undertaken by knocking down, piling and burning. Most arable land in Alberta has been cleared using the burning method of disposal.

*Depending on weather conditions during the fall and winter, burning adjacent to the primary highway system may result in a smoke hazard for the travelling public. The condition is worsened in those areas where fog also exists, with the smoke/fog combination producing poor visibility situations. In these circumstances, the department would normally erect "**Caution Smoke**" signs and, when visibility becomes seriously impaired, the department will post flagmen. In cases of severely restricted visibility, the highway would be closed with the aid of the RCMP, however, the need for highway closures has been infrequent in the past. For example, in 1986, Highway 16 was closed once for a brief period and Highway 44 was not closed at all.*

The smoke/fog experienced in the fall of 1987 was a more significant problem than before. This report addresses the situation, including legislation governing burning adjacent to highways, and recommends measures that will accommodate land clearing methods that are not counter to the safety of the travelling public.

1987 SMOKE/FOG CONDITIONS

The smoke/fog experienced in the fall of 1987 created a problem for roadway safety and two factors have been noted as particularly contributing to these conditions.

1. *From September to December, 1987 there was no significant rainfall or other precipitation, resulting in very dry conditions ideal for landowners to undertake burning. Many farmers took advantage of these circumstances and, as well as new land being cleared, many peat or brush piles from previous years were much easier to burn. Consequently, there was substantially more burning than in previous years.*

2. *Mild weather and zero wind conditions resulted in smoke from the fires being trapped close to the ground. During the still, moist air conditions of early evening and early morning, fog in low lying areas combined with smoke to settle over highways and local roads, causing severe visibility problems.*

The highways most affected by smoke and fog were Highway 16 from Wildwood to Hinton, and Highway 44 between Westlock and Fawcett. A number of accidents occurred, including a fatality on Highway 16. In addition, an isolated severe smoke/fog condition on Highway 2 by Nisku resulted in two separate accidents including a fatality. Other isolated smoke/fog problems have resulted in vehicular accidents on Highway 18 south of Thunder Lake, Highway 33 by Camp Creek and Highway 63 at Grassland.

Heavy smoke or a concentration of smoke and fog were present in all cases. The condition appears to have caught many drivers by surprise, resulting in overdriving their visual range.

Because of the severity of the smoke hazard for highway traffic during Fall 1987, Alberta Transportation and Utilities undertook extraordinary measures to assist the travelling public through areas with visibility problems.

In all locations where smoke was identified as a potential hazard, the standard "Caution Smoke" signs were erected. For example, there were 18 locations on Highway 44 where these signs were placed. In addition, on Highways 16 and 44, large warning signs were erected at the outer limits of the smoke zones advising the public of limited visibility over the next number of kilometres. On Highway 44, this signing was supplemented by other large signs advising the public of available detours during the worst smoke conditions.

During critical periods the worst sections of Highways 16 and 44 were patrolled 24 hours a day and, when conditions worsened, traffic was piloted through smoke zones. Where conditions reached an unacceptably hazardous level, the highway was closed with support from the RCMP. This entailed the placing of barricades across the road, posting flagpeople, and stopping all traffic. After smoke/fog conditions improved, 24 hour patrols were not assigned; however, highway maintenance staff continue monitoring for reduced visibility on an on-going basis.

For staff on the scene, the greatest difficulty is in assessing smoke conditions when visibility can vary from a few hundred metres (where the public can travel with caution) to almost zero (when the highway should be closed) in a matter of minutes. In this respect, there have been instances of a highway being closed and re-opened three times in a single day because conditions can change so quickly.

The special efforts of signing, patrolling and closing highways were effective for conveying traffic in safety. As well, the department entered onto private land adjacent to Highways 16, 44 and 63, with the landowners consent, to successfully extinguish burning brush piles.

EXISTING LEGISLATION

A number of articles of Alberta legislation address the issue of burning to clear land and how it may be regulated by provincial or municipal authorities. All relevant legislation deals with the hazard of fires, and smoke is not discussed specifically in most cases.

A) FOREST AND PRAIRIE PROTECTION ACT

The Forest and Prairie Act (Chapter F-14, 1980) applies to all land in Alberta except within the boundaries of a village, town, new town or city and land owned by the Government of Canada not covered by a fire control agreement. Pursuant to the Act, the Minister may designate any part of Alberta as a "non-permit" area.

Administration of the Act falls into two main areas. The Alberta Forest Service has jurisdiction within the "Forest Protection Area" which is an area established by legislation (currently Alberta Regulation 414/83). Outside of the Forest Protection Area, the appropriate municipal authority (County, Municipal District, Special Area, etc.) has jurisdiction within their boundaries. Therefore within the forest protection area, the Forest Service is responsible for fire permits. In areas where the Forest Protection Area overlaps into Counties, M.D.s, etc., the Forest Service still issues the permits in the Protection Area. A map outlining jurisdictional areas is included in the report.

Municipal Authorities issue fire permits within their area of jurisdiction, again excepting the Forest Protection area and non-permit areas. By virtue of their office, the reeve, each councillor and the secretary of each municipal district, county, etc. is a fire guardian and authorized to issue permits. As well the council of a municipal district can appoint additional fire guardians.

Within permit areas, a fire permit must be obtained prior to lighting an outdoor fire (excepting an attended campfire for cooking or warming purposes) during the fire season. The fire season is legislated as April 1 to October 31 but can be extended or shortened in any area of Alberta by the Minister through a Ministerial Order.

A Forest Officer or fire guardian (an Alberta Forest Service staff member or a municipally appointed officer) may in his discretion issue a fire permit to an applicant and may endorse on the permit any special fire control conditions with which the applicant must comply. A fire permit can be suspended or cancelled at any time by a Forest Officer or fire guardian at which time the fire set pursuant to the permit must be extinguished. When a permit is issued, an expiry date is stipulated. Prior to or on that expiry date, the permittee is to extinguish the fire or apply to have the permit renewed for a further period.

For purposes of preventing fire spread during the fire season, the Minister may order a ban on all open fires in any area of Alberta at which time any fire presently burning must be extinguished, even if it is authorized by a fire permit.

The intent of the fire permit system is not to unduly restrict burning but to prevent loss of life, property and resources by wildfire.

B) MUNICIPAL GOVERNMENT ACT

Municipalities have the right to pass by-laws to regulate burning activities within the municipal boundaries.

C) CLEAN AIR ACT

Administered by the Minister of Environment, this Act prohibits certain burning activities of materials defined as burnable or prohibited debris. Burning of material which results in visibility problems on any public roadway is prohibited, but does not include the burning of straw, stubble, grass, weeds or brush.

D) PUBLIC HIGHWAYS DEVELOPMENT ACT

Under the Public Highways Development Act, a peace officer is given the authority to enter on land, with any equipment and persons he considers necessary, to remedy conditions that may cause danger to any person travelling on a highway. The Minister of Transportation and Utilities has authority to make regulations prohibiting certain activities within prescribed distances of a highway under his jurisdiction. However, the burning of brush and debris is not one of the enumerated activities.

RECOMMENDATIONS

The following recommendations are primarily addressed to the safety hazard created by smoke from burning adjacent to the primary highway systems, however, it is recognized that similar circumstances also affect Alberta's secondary and local road networks. These recommendations are made with consideration to both the immediate and long term situations.

A) LEGISLATION - FOREST AND PRAIRIE PROTECTION ACT AND PUBLIC HIGHWAYS DEVELOPMENT ACT

Pursuant to the Forest and Prairie Protection Act, the management and issuance of fire permits will continue to be administered by the Department of Forestry, Lands and Wildlife. The Forest Protection Branch will give added emphasis to smoke hazards as part of their responsibility for fire management programs. In this regard, the following guidelines were established.

1. *Alberta Transportation and Utilities and municipalities will be contacted in October of each year to discuss the possibility of fire season extensions, with consideration given to smoke management as well as fire spread potential.*

2. *Fire and smoke management will be emphasized with all staff involved in fire permit issuance within the Forest Service. As well, these considerations will be emphasized during meetings and other contacts with the Counties and Municipal Districts that border the forest protection area. When permits are issued for burning on land adjacent to primary highways, the issuing authority will consult with Alberta Transportation and Utilities maintenance staff in the area.*

3. *Where municipal councils are the permitting authority, councils will be encouraged to enforce permit conditions through the authority given them under various legislation, particularly the Forest and Prairie Protection Act and, in addition, municipalities will promote good fire management practices amongst the landowners involved in burning.*

4. *Where an area outside the Forest Protection Area has been identified as having significantly greater potential for smoke hazard than elsewhere in the province, municipalities will be encouraged to co-operate with Provincial Departments in establishing stricter procedures and improved enforcement of burning on private land. Consideration could be given to requiring peat to be piled and fire guarded prior to burning to reduce smoke emissions. This would allow peat to be burned in the summer months when smoke does not normally cause severe problems.*

5. *With smoke emissions as an additional consideration, the future control of burning will minimize the occurrence of smoke problems on public roadways. However, in the event that changes in atmospheric conditions result in problems arising from already burning legally permitted fires, then other courses of action should be open to ensure the safety of the travelling public.*

Under Section 50 of the Public Highways Development Act, peace officers have the authority to enter private land to remedy such hazardous conditions. In this regard Alberta Transportation and Utilities will work with the peace officers and the landowners to extinguish fires where smoke emissions are a problem.

B) TRAINING AND SUPPORT

1. *Smoke management will be included as part of all future training courses offered by Alberta Forest Service for fire guardians. Normally this training is given on an annual basis to new staff, however, additional effort will be undertaken so that all staff involved in issuing fire permits recognize the smoke hazard in terms of roadway safety.*

2. *In the event Alberta Transportation and Utilities becomes involved with extinguishing fires along highways, the Forest Service will provide advice and expertise upon request.*

C) PUBLIC COMMUNICATION

Once a potential hazard to highway users from smoke/fog conditions has been recognized at a particular location, it is important that the public be advised accordingly. In this regard, every effort will be made to make the travelling public aware of hazards that may exist, and possible alternate routes, by way of the normal media process. An awareness of impaired visibility will allow the travelling public to drive defensively, always being prepared for the unexpected, and give consideration to other road users.

D) TRAFFIC ACCOMMODATION

Where a poor visibility hazard for motorists has been identified as a result of smoke/fog conditions, Alberta Transportation and Utilities will take the following steps to warn, assist, and protect the public travelling on the highway.

1. *Sign "A" will be installed as soon as possible to warn motorists of a potential smoke/fog hazard or of a condition where small quantities of smoke are being generated that may result in a minor vision impairment. The number of signs used, spacing of signs and their locations will be determined by the maintenance crew based on local knowledge and experience. Particular attention will be given to brushed areas ready for burning and harvested sections where stubble burning is common practice.*

SIGN "A"

2. *Sign "B" will be installed at appropriate locations, in the vicinity of the smoke/fog sections when visibility is reduced to a point where travel at highway speeds is considered unsafe. Also, depending on the severity of the local conditions, the transportation staff will immediately make arrangements to:*

- *monitor the highway conditions by implementing a 24-hour patrol*

- *assign flagpeople at each end of the affected ares to advise motorists of the extent of the smoke/fog and recommend reduced driving speeds*

- *notify the RCMP and undertake a joint assessment regarding the potential for the burning source to continue to be a hazard*

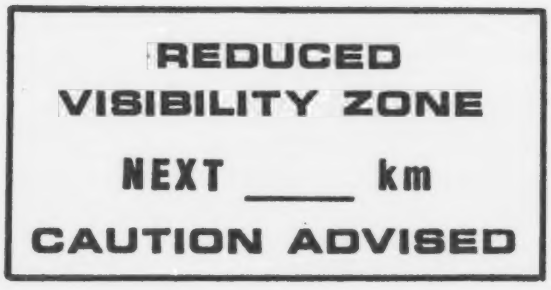
- *contact landowners with a view of extinguishing the fires*

- *contact Alberta Forest Service and the local municipality for assistance*

- *close the highway and assist the RCMP with traffic control in the event that highway travel is unsafe due to the lack of visibility*

- *ensure that the media is notified of the closure and re-opening details*

- *determine source of the smoke and exercise option of extinguishing the fire if it appears that the problem will persist*

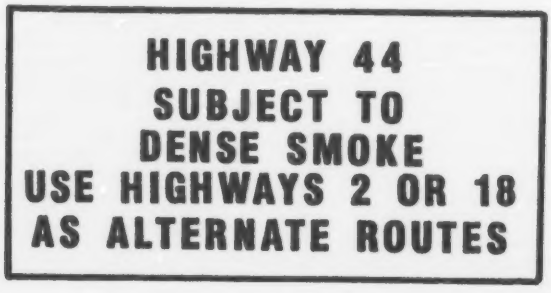


SIGN "B"

3. *Sign "C" will be installed when long sections of highway may be affected by a number of smoke/fog conditions. The sign will be erected at strategic locations as an advisory to travellers and supplementary to other warning signs. Flashing lights will be activated during poor visibility conditions.*

SIGN "C"

4. *Advisory signs will be installed at strategic locations to advise motorists of alternate routes. Each sign and message will be designed to meet the local needs. A typical sign is shown below:*



E) SCHOOL BUS ROUTES

In those rural areas where smoke impacts visibility on designated school bus routes, Alberta Transportation and Utilities will work with the local municipalities and assist in establishing alternate school bus routes.

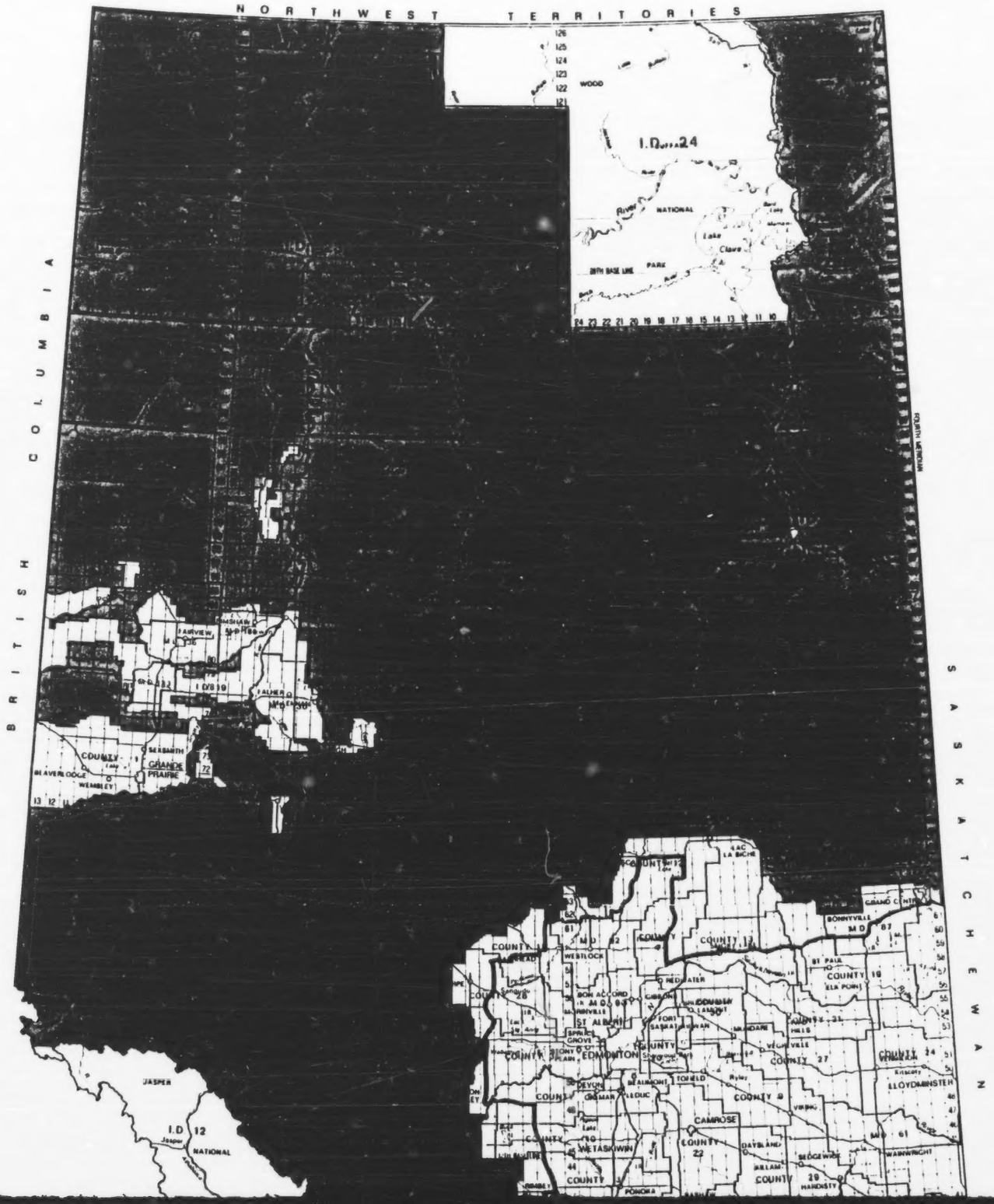
CONCLUSION

There is still a lot of land in the province that, if cleared, can successfully be brought into agricultural production. However, this requires that bush be knocked down and disposed of, or in some areas, that the peat moss cover be removed. In the absence of other more economical means, it would appear that burning is still the best method for disposal.

It is considered that the present legislation, the corresponding permit system and the introduction of emphasis for smoke management in addition to the fire spread potential, can adequately address the smoke situation even in the worst case years, such as 1987. For total success, it is important that those responsible for issuing permits take an active role in enforcement within their area of jurisdiction. Also, it is important that the landowner undertaking burning recognize the potential of smoke problems, as permits do not absolve them from the responsibility of ensuring that their fires do not constitute a hazard to other members of the public.

The principle of fire management affords a means of reducing fire and smoke hazards. The configuration and contents of burning piles, weather conditions, and the regular maintenance of burning piles are all factors that determine the type of burn that occurs. In this regard, the on-going training provided by Alberta Forest Service will go a long way towards reducing hazardous conditions that could occur.

Notwithstanding any actions taken to ameliorate the smoke hazard, there is always a responsibility on the road user to drive according to current conditions. Visibility may be impaired for many other reasons such as fog or snow, and the travelling public will be encouraged to drive defensively, always being prepared for the unexpected, and giving due consideration to other road users.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WOOD
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NATIONAL
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Clear
FAIRVIEW
GRANDE PRAIRIE
BEAVERLODGE
WEMBLEY
JASPER
I.D. 12
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ST ALBERT
SPRUCE GROVE
STONY PLAIN
DEVON
LEDUC
BEAUMONT
TORRED
CAMROSE
WETASKIWIN
WESTLOCK
BON ACCORD
GIBBON
REDWATER
FORT SASKATCHEWAN
BONNYVILLE
ST PAUL
ELK POINT
VEGREVILLE
VIKING
DAYSLAND
HARDISTY
LLOYDMINSTER
WAINWRIGHT
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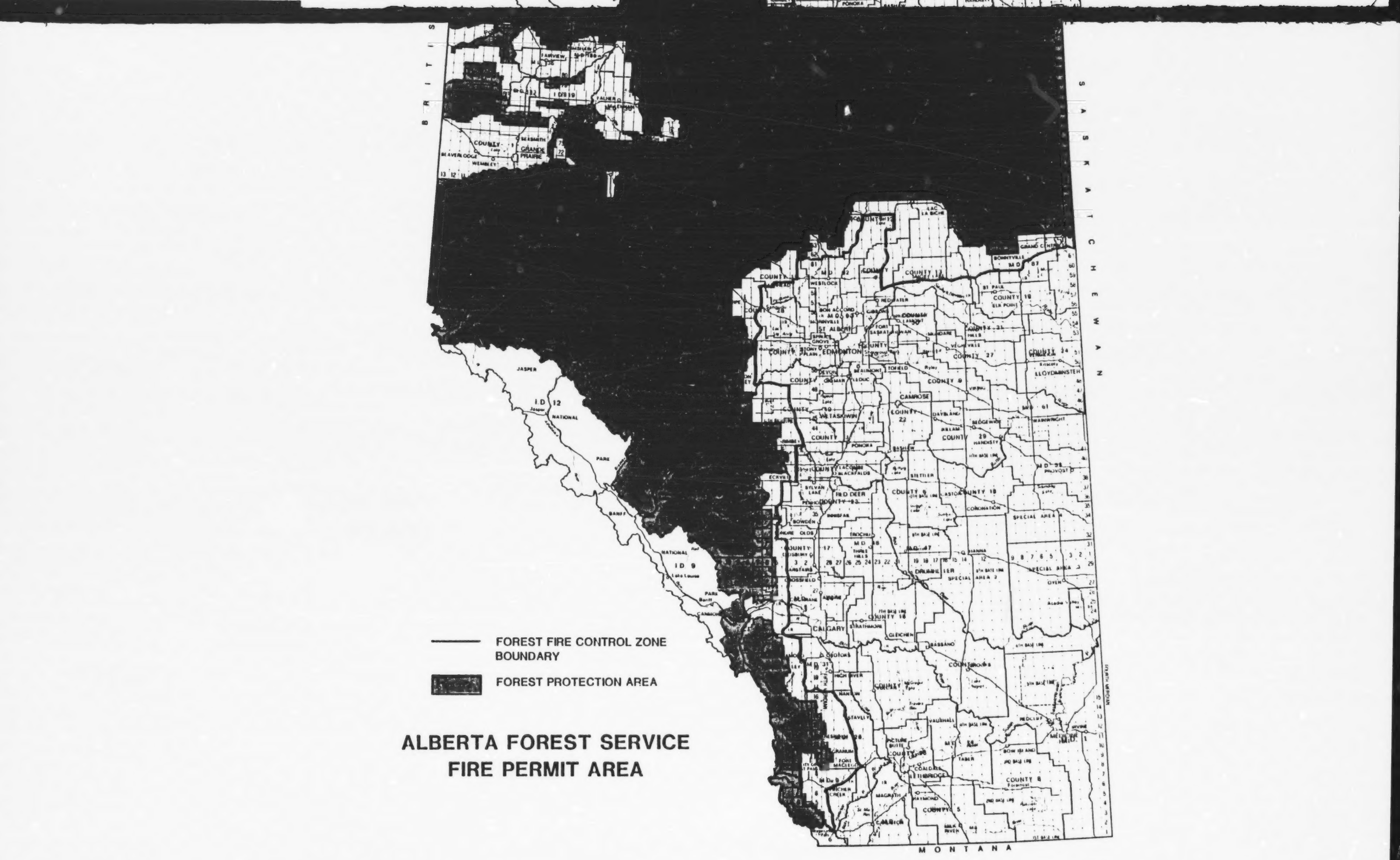
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M.D. 39
M.D. 87
M.D. 88
M.D. 91
M.D. 92
M.D. 93
SPECIAL AREA 2
SPECIAL AREA 3
SPECIAL AREA 4
FOREST FIRE CONTROL ZONE BOUNDARY
FOREST PROTECTION AREA
ALBERTA FOREST SERVICE
FIRE PERMIT AREA